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COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-109630

DEC 1 1975

The Honorable John V. Tunney
United States Senate

Dear Senator Tunney:

On October 24, Mr. Harry Havens (Director, Office of Program Analysis) testified before the Subcommittee on the Environment. His testimony was based upon our staff paper "A Comparison of Three Estimates of Costs of the Proposed Toxic Substances Control Act" (OPA-76-6). In order to resolve the apparent differences between our testimony and the testimony of the Manufacturing Chemists Association (MCA), you asked us, in your letter of November 7, 1975, to study some of the issues further. Part of our original testimony dealt with the MCA "Study of the Potential Economic Impacts of the Proposed Toxic Substances Control Act as Illustrated by Senate Bill S. 776 (February 20, 1975)," and we found that several of the statements in that study were not well documented. In order to see if these statements could be substantiated by information not included in the MCA study, we met with representatives of the MCA and discussed their background information and our points of disagreement.

The cost estimates presented in the MCA study were significantly higher than those made by the Environmental Protection Agency (EPA) in its "Draft Economic Impact Assessment for the Proposed Toxic Substances Control Act S. 776," dated June 1975.

We believe that the basic issues are:

1. Estimates of the number of chemicals to be tested and the testing costs per chemical;
2. The "maintenance of innovation" cost;
3. The methods of data collection for the MCA reports; and
4. The economic impact estimates.

Each of these will be discussed in turn.

1. Estimates of the Number of Chemicals to be Tested and the Testing Costs Per Chemical

In our staff study, we pointed out that the three studies of the TSCA differed substantially in their estimates of costs of testing. We noted that the EPA cost figures were based on assumptions that seemed to be the most consistent with the TSCA requirements, but we also pointed out that

where the industry studies made seemingly valid points. In our subsequent discussions, representatives of the MCA expressed their concern that the TSCA would require testing costs substantially greater in scope than what is envisioned by the EPA. In particular, they cited their findings that thorough toxicity testing of a chemical substance could total as much as $800,000, as compared to the range of $200,000 to $400,000 assumed in the EPA report.

At this point, we are unable to add to our earlier analysis of this issue, which continues to be the area of greatest uncertainty in the cost estimates. We understand that the Subcommittee has obtained other expert testimony which has shed more light on this question. In addition, we have suggested that the Subcommittee consider including in the proposed legislation more specific requirements for later evaluation of the testing requirements and economic impacts of the Act as a whole, so that modifications of the legislation can be considered on the basis of more substantial information than is now available.

2. "Maintenance or Innovation"

In the MCA study, one of the costs listed is "maintenance of innovation." This appears to be an estimate of the cost required to maintain the same rate of successful product innovation as before the imposition of testing requirements and restrictions on production. Maintenance of innovation costs appear in only two of the study's four scenarios. The other scenarios assume "displacement of innovation," whereby the firms do not attempt to maintain their former rates of new product introduction. In the two scenarios where this cost is included, it is estimated at $600 million and $300 million, depending on whether "extensive testing" or "low level testing" is assumed. Scenario #4, which is the lowest in total cost, does not include maintenance of innovation as a cost.

We have raised three basic objections. First, in our judgment, firms would not necessarily behave in such a way as to incur these extra costs. Second, even if they do incur these costs, we do not believe these should be counted as costs of the TSCA. Third, even if these "maintenance of innovation" costs were conceptually valid, we do not believe that the MCA study has estimated them accurately. We now consider each of these objections.

a. Firms will probably not increase their research and development spending.

The TSCA would have two basic economic effects. The additional testing costs are likely to be passed on in higher prices. This would tend to lower the demand for chemical products. Furthermore, restrictions are placed on chemicals shown to be dangerous would tend to make it more difficult to introduce commercially successful products. These two factors

would tend to reduce the rate of return on investment in research and development (R & D), which would mean that profit-maximizing firms would spend less, not more, on R & D. (As we noted in our staff paper, firms might spend more on R & D meant to reduce or partially avoid testing or restrictions. They might invest in research on more efficient testing techniques and on developing products that would not require much testing. But this type of spending, if successful, would pay for itself in reduced costs of testing and restrictions. Therefore, it would be double-counting to count it as a cost.)

It must be said, however, that economic theory is not clear on precisely what determines a firm's R & D spending. If a firm is motivated by efforts to maintain the same rate of new product introduction, then it would have to increase its R & D spending. Although such behavior would not be in accord with the goal of maximizing profits, we cannot prove that firms would not act in this manner. There is a large body of economic literature on the goals of the firm, in which sales maximization and attempting to achieve a target rate of return are analyzed, but very little has been found to indicate that firms actually do behave in these ways.

b. Such costs, if they occur, are not costs of the TSCA.

The costs of testing and of restrictions are estimated in another section of the MCA study. In particular, an attempt is made to estimate the losses to the industry that would occur when a product (which was costly to develop) cannot be freely marketed. If a firm decides to increase its R & D to develop additional new products, then it must believe that these costs will be justified by the results, whether the results be greater profits, a greater market share, or some other effect. We do not believe it is correct to count in as a cost something which, one would assume, is offset by benefits to the firm.

c. We do not believe that the MCA study has accurately estimated changes in R & D spending that might result from the TSCA.

The maintenance of innovation cost estimates were obtained from data compiled from questionnaires and interviews with fifteen firms. The information obtained was the basis for the $600 million and $700 million estimates of maintenance of innovation costs. In order to establish that the process of obtaining these estimates was reliable, several questions must be answered.

(i) Was the hypothetical new situation (the enforcement of the provisions of a Toxic Substances Control Act) described accurately to the firms being surveyed?

The consequences of the TSCA were depicted in brief statements (MCA study, pages 38-39 and 250-251). These statements present a fairly strict interpretation of the Act, certainly one that would require testing

than EPA envisions. There is, of course, considerable disagreement and uncertainty on this point. These brief statements, however, are far too short to do justice to the complexities and subtleties of the proposed Act. We do not know how the provisions of the TSCA were further depicted by the interviewers.

Our second criticism on this point is that logic of the incentive to maintain innovation is not related to the questions or the responses. The firms were simply asked for the percentages by which research costs, number of products launched, and overall sales volume would change. They were not asked how much more they would have to spend in order to maintain the same rate of innovation. Yet, on page 88, the study describes the findings as "Extra R & D Expenditures Needed to Maintain Current Levels of Innovation Besides Costs of TSCA Compliance" and "Maintenance of Present Budget For Innovation: % Decrease in Number of New Products Launched Without Extra Expenditures." It is not explained how these results could have been obtained from the relatively simple questions asked.

(ii) Were the firms able to respond accurately? That is, could they be expected to predict their response to the new situation?

Aside from the fact that the TSCA was not fully described, there is a question as to whether the firms could accurately predict their own responses to the proposed legislation. Analysis of surveys of firms' plans for investment in plant and equipment have shown that there can be significant differences between firms' plans and their subsequent actions.

In addition, there is some question as to whether the firms would accurately reveal their actual plans, however uncertain. In general, the industry believes that the TSCA would be very costly. If they were to misrepresent their intentions, the obvious incentive would be to respond in such a way as to make the TSCA appear more costly. We were told by the MCA that the firms did not know how their responses would be used, and we have no reason to question that statement. Nevertheless, if a firm wished to tailor its response to denigrating the TSCA, it clearly would lean to the side of responding with higher costs and lower numbers of new products launched. This bias, if it exists, would apply only to the innovation questions; it would not apply to the questions on numbers of products, etc., in the "Survey of New Product Areas."

(iii) Were the estimates (the $600 million and the $200 million) derived correctly from the survey?

It appears to be true that these estimates were not derived correctly from the survey data. The $600 million was arrived at by multiplying a $2 billion (estimated) R & D expenditure by a 30 percent increase. We do not question the $2 billion for existing R & D; it is the 30 percent figure that appears to be a significant overestimate. According to the MCA

study (page 95), there was a considerable range of responses. In our discussions, an MCA representative said that some of the firms reported that they would reduce their R & D spending. We believe that with this type of data the researchers should have estimated the industry's mean percentage change in R & D expenditures and provided confidence limits for that estimate. We conjecture that with this wide range of responses from such a small sample of firms the confidence limits would be far apart. That is, no great credibility could be attached to the estimate. In fact, neither the sample mean nor the sample standard deviation are reported. In fact, the 30 percent seems to be the highest of the range of effects, rather than an average. The 30 percent figure is therefore, substantially larger than whatever the average figure might be, and it does not represent any kind of typical industry behavior. The 15 percent figure, which yields the $300 million cost, does not seem to be justified either; it is meant to apply to a lower level of testing. But, again, it does not appear to represent an estimate of average industry response.

In summary, we maintain the position we took in our staff study--"the $600 million figure should not be counted as a cost." Nor should the $300 million figure be counted.

3. Methods of Data Collection for the MCA Report

Some questions about the confidentiality of MCA data were raised in conjunction with the MCA testimony on September 21, 1975. Although it is true that the MCA has promised the respondent firms that information from individual questionnaires will not be divulged, we do not believe that this presents a serious problem in resolving the differences among the various cost studies. The study presents the aggregate figures derived from the questionnaires, and that is the important source of information on such questions as the number of new chemical products developed.

On certain questions, we have disputed the MCA figures. On the question of "maintenance of innovation," we do not believe that the estimates were accurately derived from the survey. On the question of economic impact, we do not agree that the data support all of the conclusions. Our analysis of these problems was not hindered by the confidentiality of the individual questionnaires.

4. Economic Impact Estimates

We have a number of reservations about the approach taken in the MCA study to obtain estimates of the impact of the MCA upon gross national product, employment, prices, and international trade.

The MCA study used the INFORUM model to generate its economic impact estimates. While we have no particular criticisms of the model itself, it should be realized that there are a number of possibilities for error when

it, or any other complex econometric model, is used for a specific purpose. The results depend upon what information is fed into the model.

In general, we agree that the TSCA would increase costs of production in the chemical industry and that most of these costs would be passed on to the consumer. Because chemicals are used as inputs to other manufacturing processes, the impact is likely to spread through the economy. We question the magnitude of the effects estimated in the MCA study.

Before we discuss the specifics, it should be pointed out that we believe that the MCA's "broad model" gives economic impacts that are at least twice as high as they should be. The reason is that the "maintenance of innovation" costs, which we believe should not be counted, account for about half of the costs in that model. All of the economic impacts are roughly proportional to the magnitudes of the original costs estimates. For example, if the highest cost estimate made by the Environmental Protection Agency ($141.5 million) were used as the basis for the economic impact modeling work, the economic impacts would be about one-ninth of the magnitude of the MCA figures.

Effect on Prices

In the MCA "broad model," it is assumed that industry costs would be passed on in the form of higher prices. This gives a 1.28 percent increase in the price of chemical industry products, which is plausible if one accepts the MCA cost estimates. Lower cost estimates, which we believe to be more accurate, would give proportionately smaller price increases. The impact on the Consumer Price Index, which measures the price of all consumer goods, is estimated as one-half of one percentage point. This figure seems much too large; it would represent a significant fraction of all inflation. The MCA cost figure of $1.3 billion is less than one-tenth of one percent of GNP, and so a similar figure for increase in the CPI would be more plausible. We are unable to explain why the MCA figure is so large. Again, if one accepts a lower cost figure, the impact on the CPI would be proportionately smaller.

In the MCA "selective model," it is assumed that none of the costs would be passed through in higher prices. We disagree with that assumption.

In summary, we believe that an accurate estimate of TSCA costs would yield estimates of price increases significantly lower than those of the MCA study.

Impact on Gross National Product

There are [illegible] the TSCA [illegible] to do with the workings of the domestic economy and the other [illegible] international trade. In the domestic economy, [illegible] prices of chemicals would reduce

the demand for chemical products. However, there would be an increase in the demand for testing services and for administration personnel which would be nearly as large, in dollar terms, as the decrease in the output of chemicals. In the MCA study, the "domestic effect" is quite small, and most of the impact on GNP comes from the effects on imports and exports.

Increased prices for chemical exports could reduce the demand for exports, and this tends to reduce GNP. Again, we agree that some effect of this kind could be expected, but we believe that the MCA report greatly overstates the magnitude of this effect.

First of all, it is not certain that firms would increase the price of exports in proportion to increased testing costs. As far as most exports are concerned, testing costs will have already been incurred; they are fixed costs, not variable costs. In order to meet competition in foreign markets, they may well absorb most of the costs due to the TSCA.

Second, the MCA study appears to have assumed that export prices would increase by more than the 1.28 percent estimate for prices of chemicals produced domestically. The information is not presented in the report. MCA gave us the data that was used for six categories of chemical exports and imports, and all of these figures significantly exceeded 1.28 percent. The resulting bias appears to be an overstatement of the negative impact on both the balance of trade and gross national product.

The study presents estimates of the change in the balance of trade in chemicals, but only on page 212 does it show the estimated impact on imports separately. No information is presented on exports separately. The impact on imports is far larger than what would be consistent with the earlier assumptions about price increases and demand elasticities. If this inconsistency also occurs in the export estimates, it would mean that the estimate of the balance of trade impact is too large by several orders of magnitude.

Nowhere in the report has it been taken into account that increased testing is of some value to consumers--they can feel more confident that the chemical they purchase is safe. This has the effect of increasing the demand for chemicals, which would act to partially offset the decrease in demand caused by higher prices. We have not attempted to estimate the magnitude of this effect, but we point out that it would be inconsistent to ignore the negative effects on imports and on GNP.

In summary, we believe that the TSCA would have some adverse impact, but the MCA report greatly exaggerates that effect.

Conclusions

Our discussions of the MCA report with their consultant on TSCA have not caused us to change the conclusions of our April report. We continue to

maintain that the MCA report, in several instances, overestimates the costs to industry of the proposed TSCA. In our judgment, a major source of overestimation is the "maintenance of innovation" cost.

Our staff study listed several other points upon which we disagreed with the approach taken by the MCA report and the EPA study as well. To put these points in their proper perspective, however, it should be emphasized that the main problem in estimating cost is to determine the extent of testing required.

Sincerely yours,

Comptroller General
of the United States